[redacted]

KB/Concur/RIP/08-11-06/Below

RIP/Keith/28 Jan 06

FACT SHEET

SUBJECT: Progress of Reconnaissance Development Projects (Project 92C

PROJECT TITLE: CORONA (DISCOVERER) Project NR 630-117L-117L-AT RD

DEPARTMENT OF THE AIR FORCE AND THE CENTRAL INTELLIGENCE AGENCY

6 April 1961

1. Requirement: The project is in response to a requirement stated by the United States Intelligence Board, document 33-6/8, dated 5 July 1960, subject: Intelligence Requirements for Satellite Reconnaissance Systems of which SAMOS is an Example. The desired ground resolutions are twenty (20) feet for search type missions, five (5) feet for target description, and one (1) foot for technical analysis. Repetitive coverage is desired and the frequency of coverage will be predicated upon: the state-of-the-art (reliability); the intelligence situation; availability of payloads; boosters, etc.; and cost.

2. Type Vehicle: THOR/AGENA Space Booster combination.

(a) First Stage: Powered 2.5 minutes to 70NM down range. Guidance is accomplished by a programmed autopilot.

(b) Coast Period: Power-off for 2.4 minutes to 360NM down range.

(c) Second Stage: Powered 2 minutes to 770NM down range. Guidance accomplished by inertial reference.

(d) Reorientation: The space capsule and payload is turned 180° to operational orientation (polar orbit) by gas reaction jets.

(e) Operational: Orbital life is one to four days. Photography of the areas of interest is programmed. Film capacity is 72-7600 feet of 70mm film or sufficient film to provide approximately 255,000 linear miles of photographic coverage.

(f) Recovery: The space vehicle is re-oriented in orbit in order to allow retro-rockets to eject the capsule from the Agena in a reverse and downward attitude. A parachute system is deployed to allow for an air snatch or sea recovery.

3. Function: Covert satellite photographic reconnaissance of the Soviet block and other denied areas.

4. Type of Activity: The present system is capable of accomplishing the search-type reconnaissance mission (approx. 40 feet ground resolution).

COPY __ of 6 copies.

Page 1 of __ pages.

Fact Sheet (Continued) Proj. Title: CORONA (REDACTED)

5. Operational Environment: Orbital altitude is 150-200 nautical miles. The reconnaissance system is limited to day (sun angle 12° or better) good weather conditions.

6. Political Environment: Utilization of the system is dependent on Presidential approval. Approval may be obtained for a series of shots or may be required for each and every shot, depending on the political situation at the time. Satellites are less likely to be affected by political considerations that would affect other reconnaissance systems.

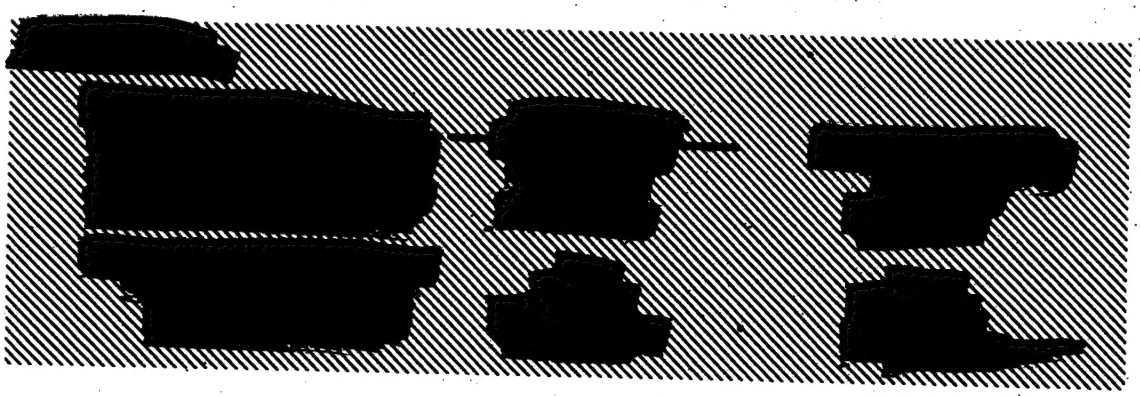
7. Development Program: The camera development program is under the cognizance of the CIA.

(a) Corona Basic (C): The basic camera has a 24-inch focal length lens; uses seventy millimeter wide film, and operates in a panoramic mode taking pictures across the line of flight (180 miles wide). One successful recovery (this camera - film only) has been accomplished. Ground resolution of the film obtained was approximately forty feet.

(b) Corona Prime (C'): This is the second generation camera and is currently being flown. The camera is basically the same as the original, except for structural improvements and general engineering clean-up. One capsule (this camera - film only) has been successfully recovered. The same general ground resolution was obtained; approximately forty feet.

(c) Corona Double Prime or Oh! (C"): This camera was a prudent improvement of the C'. It was cancelled in favor of a proposal for a Corona Triple Prime (C"') camera which the [redacted] Corporation had developed as an "in-house" effort.

(d) Corona Triple Prime (C"'): A new panoramic camera that utilizes the same space and concepts as the C' camera. The C"' incorporates a flexible platoon, revolving optics and new structural material. The film path incorporates air twists for turning the film in lieu of curved rollers. The focal length of the lens is twenty-four inches and the lens aperture is f/3.5. The latter permits the use of new fine grain film. The expected ground resolution is approximately 25 feet.



COPY 1 of 6 copies.
Page 2 of 3 pages.

9. Status: The C' cameras will be flown through June 1961. Operational readiness date for the C'' is July 1961. This will allow for utilization of the slower finer grain films during the period of most favorable weather and sun angle. Fourteen cameras have been launched. Three of the recoveries have been successful. Due to a camera malfunction, film was not obtained from one of the recovered capsules.

Approximately 22,752 linear miles of photography have been obtained for a total of 4,288,412 square miles. Approximately 317,376 square miles of the coverage was duplicative coverage. (Total USSR equals 7,325,823 square miles). Between 55 and 65% of the coverage is obscured by clouds. Useful information is obtained thru holes in clouds and areas of very thin cloud cover.

A proposal for a convergent stero installation of C'' cameras is under consideration for a CY-1962 follow-on program. It is known from experience that the smallest stereoscopically recognizable ground parallax is a factor of about 1/2 to 3/4 smaller than the smallest monocularly resolved distance. Therefore, the expected ground resolution for this type of installation is 12 feet. All ground resolution figures previously quoted relate to object recognition. Resolution required for object identification is usually two times that required for recognition. In this case objects twelve feet on a side will be recognized and objects twenty-four feet on a side will be identified.

The current launch schedule is as follows:

Mission	[redacted]	Payload	Pad	Launch Date
9016A	1106	A-2	5	8 April
9017	1107	C prime	4	2 May
9018	1108	C prime	75-1	6 June
9019A	1109	A-3	5	June 1961
9020	1110	C prime	4	July 1961
9021	1111	C triple prime	4	July 1961
9022A	1112	A-4	5	July 1961
9023	1113	C triple prime	4	August 1961
9024A	1114	A-5	75-1	August 1961
9025A	1115	A-6	5	September 1961
9026	1116	C triple prime	4	October 1961
9027	1117	C triple prime	75-1	October 1961
9028	1118	C triple prime	5	October 1961
9029	1119	C triple prime	4	November 1961
9030	1120	C prime	75-1	November 1961

If the above schedule is kept, there will be two unassigned C' cameras (no vehicles) and three unassigned C'' cameras.

10. Problem Areas: The lack of a common accepted definition of resolution "in terms of the job to be done" has complicated the R&D evaluation process. The correlation of what an interpreter can see at various design resolution levels (film obtained from space) is not known. An accurate and detailed analysis of film obtained from space is required in order to determine what system resolutions will be required for specific jobs in the future. In order to establish a common reference, the following chart is used:

Types of Resolution	Example	USIB Req.	Data Criteria	Design (MRD) Resolution	Capability and Status
Detection	River	-	Level A (50'-200')	20'	E-2 (three available -100'
Recognition	Car	20'	Level B (10'-40')	8'	C' (operational - 40') C'' (operational in July- 20') Stereo C''' (proposed CY 1962 - 10') E-6 (operational CY 1962)
Identification	Type: Coupe or Sedan	5'	Level C (2'-8')	2'	E-5 (operational Sept 1961 7')
Technical	Year and Model 1959 Buick	1'	Level D (0.5'-2')	4'	One proposed by "DeCoda Delft Co" of Holland. No funding.

Information currently available on E-6 camera does not indicate significant improvement over the E-5 and Stero C'''. It is possible that more effort should be placed upon development of a system with design resolution of 4 to 2.0 feet.

In order to insure that all efforts (R&D operational, economic, political, etc.) are properly placed, it is recommended that a detailed analysis of all over-flight (emphasis on space) film be conducted. The analysis should determine the following:

(a) What information or intelligence did we obtain that was not already known (COMINT, ELINT, attaches, embassies, agents, news media, etc.)?

(b) What information can be obtained from photography that cannot be obtained by other methods? How significant is this information in terms of stated requirements?

(c) The degree of correlation that exists between photo intelligence and information obtained from other sources (to include the timing, simultaneous and month after, etc.)?

(d) The contribution that each type of information makes to photography. (Photo tells you what and where it is, HUMINT tells you what is under the roof)?

(e) The degree that density indicators and rate of change indicators can be utilized in lieu of higher resolution. What questions will higher resolution answer?

(f) Significant changes in war plans that were accomplished as the result of new information obtained by photographic reconnaissance only.

(g) Based on everything that is known now and collection capabilities in being determine the relative value of each type of collection, recommend appropriate priorities, frequency of coverage and resolution.